

CALENDAR ITEM

48

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10/30/07
W 26202
PRC 8727.1
J. Brown
M. Meier
T. Filler

S 38

AMENDMENT OF LEASE

LESSEE:

Cabrillo Power I, LLC (Cabrillo)
1817 Aston Avenue, Suite 104
Carlsbad, CA 92008

APPLICANT:

Poseidon Resources Channelside LLC (Poseidon Resources)
501 West Broadway, Suite 1260
San Diego, CA 92101

AREA, LAND TYPE, AND LOCATION:

5.548 acres, more or less, of sovereign lands in the Pacific Ocean, city of Carlsbad, adjacent to Agua Hedionda Lagoon, San Diego County.

AUTHORIZED USE:

Continued use and maintenance of existing intake and outfall structures.

LEASE TERM:

Twenty years, beginning December 14, 2006.

CONSIDERATION:

First year's rent of \$123,000, referred to as the "Base Rent". The "Base Rent" to be adjusted annually by the Consumer Price Index (CPI) for All Urban Consumers, San Diego, CA, with the State reserving the right to fix a different "Base Rent" periodically during the term of the lease, as provided in the lease. This consideration is for the lease as a whole, and not simply for the amendment here considered.

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PROPOSED AMENDMENT:

SECTION 1 – BASIC PROVISIONS is amended to include Poseidon Resources (Channelside) LLC as a co-Lessee.

SECTION 1 – LAND USE OR PURPOSE is amended to allow the intake of sea water and the commingling of brine water discharge for the desalination facility as described in Section 3 of Lease PRC 8727.1.

SECTION 1 – CONSIDERATION is amended to require Poseidon Resources to provide such other consideration as may be deemed by the Commission to be in the best interest of the State, which includes, but is not limited to, the monetary value of actual or potential environmental damage anticipated from the proposed use of the Lease Premises. Such value may be determined and considered by the Commission pursuant to Section 4, Paragraph 2. Consideration (b) Modification in the Lease. No such modification shall become effective unless Lessee is given at least thirty (30) days notice prior to the effective date pursuant to Section 4, Paragraph 2. Consideration (b) Modification, in the Lease.

SECTION 2 – SPECIAL PROVISIONS is amended to include the following paragraphs:

Cabrillo and Poseidon Resources, as Co-Lessees, or individuals, shall be required jointly and severally to comply with all of the reservations, terms, covenants and conditions of the Lease; provided, however, that: (i) Cabrillo shall be responsible for obligations under the Lease pertaining to its power plant facility; (ii) Poseidon Resources shall be responsible for obligations under the Lease pertaining to its desalination facility; and, (iii) If there is a disagreement between Poseidon Resources and Cabrillo as to their respective responsibilities under the Lease, that dispute shall be resolved by Lessor.

Poseidon Resources, as a separate obligation, shall provide 37 acres, or any greater amount required by another federal, state or local regulatory agency, of marine wetlands restoration, as mitigation for the unavoidable intake (impingement and entrainment) and mortality of marine life associated with the use of the Lease Premises for the desalination facility operation. Poseidon Resources, as a separate obligation, shall also be responsible for providing funds to operate and maintain the marine

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wetlands restoration area for the term of the Lease or as otherwise required by another federal, state or local regulatory agency.

Without interference with, or interruption of, power plant scheduled operations and at its sole cost and expense, Poseidon Resources, as a separate obligation, shall use the best available design, technology, and mitigation measures at all times during which this Lease is in effect to minimize the intake (impingement and entrainment) and mortality of all forms of marine life associated with the operation of the desalination facility as determined by the San Diego Regional Water Quality Control Board or any other federal, state, or local entity.

Poseidon Resources, as a separate obligation, shall provide notice and sufficient details to Lessor 120 days prior to any changes in ownership or assignment of interest as defined in Section 4, Paragraph 10 of the Lease. Ten years from October 30, 2007, Lessor will undertake an environmental review of the ongoing impacts of the operation of the desalination facility to determine if additional requirements pursuant to Paragraph 12 are required. Lessor will hire a qualified independent environmental consultant at the sole expense of Poseidon Resources with the intent to analyze all environmental effects of facility operations and alternative technologies that may reduce any impacts found. Lessor may require, and Poseidon Resources shall comply with, such additional requirements as are reasonable and as are consistent with applicable state and federal laws and regulations, and as Lessor determines are appropriate in light of the environmental review.

Poseidon Resources, as a separate obligation, shall provide copies of all regulatory monitoring and compliance reports pertaining to the operation of its desalination facility to Lessor at the time of submitting such reports with any regulatory agency.

Poseidon Resources, as a separate obligation, shall provide Lessor with a performance deposit in the amount of \$1,000,000. At any time during the term of the Lease, Lessor may require an increase in the amount of the performance deposit to reflect economic inflation or to cover any additionally authorized improvements, alterations, or purposes of any modification of rental.

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Poseidon Resources, as a separate obligation, shall provide to Lessor, in a form approved by Lessor's staff, an unconditional guarantee by parent company Poseidon Water LLC for full performance by Poseidon Resources of all the obligations under the Lease.

Prior to the operation of the desalination facility on the Lease Premises, Poseidon Resources, as a separate obligation, shall provide to Lessor a detailed report of compliance with Order No. R9-2006-0065, NPDES No. CA0109223, adopted by the San Diego Regional Water Quality Control Board, on June 14, 2006, and became effective on October 1, 2006, and shall expire on October 1, 2011.

Poseidon Resources acknowledges that Lessor may conduct a public hearing five years after the effective date of this Lease Amendment in order to publicly review and evaluate Poseidon Resources' compliance with the terms of the Lease as provided for in Section 4, Paragraph 6, including, but not limited to, compliance with the federal Clean Water Act, and California's Porter-Cologne Water Quality Control Act and paragraph 12.

In the event that Poseidon Resources fails to comply with any and all of its separate obligations under this Lease, Lessor may terminate Poseidon's rights under this Lease without affecting any or all of Cabrillo's rights or obligations under this Lease.

Poseidon Resources shall not make any changes in use or operation of the intake channels and jetties without prior authorization by Lessor.

At any time after Cabrillo notifies Lessor in writing that Cabrillo will no longer be using the facilities on the Lease Premises in connection with the production of electricity, Cabrillo may apply to Lessor for approval of an assignment of its obligations under the lease to Poseidon Resources. In reviewing Cabrillo's application for approval of an assignment, Lessor will take into account Poseidon Resources' past performance and the likelihood that Poseidon Resources could and would carry out all obligations under the lease as sole lessee. In the event that Lessor finds that there is a substantial probability that Poseidon Resources would not or could not carry out all such obligations, then Lessor may disapprove the assignment in which case, at Cabrillo's option, the lease would terminate or Cabrillo would remain as Co-Lessee.

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SECTION 4 – GENERAL PROVISIONS is amended as follows:

Paragraph 11, Default and Remedies, (a) Default, Paragraph (4) is hereby deleted in its entirety and is replaced with the following:

- (4) Co-Lessee's failure to obtain, maintain and comply with all necessary governmental permits or other entitlements;

All other terms and conditions of the lease shall remain in effect without amendment.

The complete copy of the Lease Amendment is on file in the Sacramento office of the California State Lands Commission.

1) PROJECT DESCRIPTION

On February 6, 2007, Poseidon Resources applied to the Commission for consideration of the desalination use of the existing intake and outfall structures.

Poseidon proposes to co-locate a four-acre desalination facility within the 95-acre Encina Generating Station currently owned by Cabrillo. The desalination facility as designed would produce up to 50 million gallons per day (MGD) of RO product water. From the desalination plant, the product water would be distributed along several pipeline routes (some proposed, some planned, and some existing) to the city of Carlsbad and various local water districts in Northern San Diego County. Poseidon Resources has indicated that the desalination plant is proposed to be operational by 2010.

Poseidon Resources and Cabrillo have entered into a Ground Lease and Easement for approximately 33 years from the anniversary of the commercial operation date of the desalination facility with an option to extend the term for up to two consecutive additional periods of ten years that is binding on successors in interest.

The Cabrillo power plant currently uses OTC technology to cool its generators, and the desalination facility would use this water as its source water. This source water would be desalinated using RO technology producing approximately 50 MGD of product water and up to 56 MGD of concentrated seawater (brine) as a by-product. The brine solution would then be commingled, diluted, and discharged with the OTC flows originating from the power plant. Total sea water

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volumes that would be needed for the desalination process under current conditions would be approximately 106 MGD.

Cabrillo and Poseidon Resources have entered into an Agreement that specifies the operational and maintenance responsibilities for co-locating the proposed desalination plant adjacent to the existing power plant.

According to Poseidon Resources, eight San Diego County public water agencies (Carlsbad Municipal Water District, Valley Center Municipal Water District, Rincon del Diablo Municipal Water District, Sweetwater Authority, Rainbow Municipal Water District, Vallecitos Water District, the Sana Fe Irrigation District and Olivenhain Municipal Water District) have entered into public-private partnerships with Poseidon Resources Corporation and signed long-term purchase agreements to receive 100 percent of the desalinated water from the Carlsbad desalination plant.

2) DESALINATION BACKGROUND INFORMATION

Desalination is a process that removes dissolved minerals (including, but not limited to, salt) from sea water, brackish water, or treated wastewater. A number of technologies have been developed for desalination, including reverse osmosis (RO), distillation, electrodialysis, and vacuum freezing. The proposed Poseidon desalination project involves the RO process. In the RO process, ocean water is pretreated to remove particles and then pumped at high pressure through permeable membranes to separate the salts from the water. The quality of the water produced depends on the pressure, the concentration of salts in the water, and the salt permeation constant of the membranes. Product water quality can be improved by adding a second pass through the membranes, whereby product water from the first pass is fed to the second pass.

3) ONCE-THROUGH COOLING BACKGROUND INFORMATION

By drawing in substantial volumes of ocean water, the desalination facility will have some of the same impacts as once through cooling operations at coastal power plants. "Once-through cooling" (OTC) is the process wherein ocean water is pumped through power plants for cooling and then discharged back into the ocean.

Environmental impacts from OTC include the potential for marine organisms to be impinged and entrained as a result of the large volume of seawater intake

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required for cooling (Exhibit E). Impingement occurs when marine organisms are trapped against components of the cooling water system, such as screens, where they die. Entrainment is the induction of smaller marine organisms into and through the cooling water system where most, if not all, of the organisms are destroyed by mechanical systems, temperature increases or toxic stress. In addition, OTC results in biological impacts through thermal discharge. Thermal discharge refers to the release of cooling water at temperatures above ambient conditions resulting in elevation of the temperature of marine waters in the immediate vicinity of the outfall. These effects adversely impact coastal and ocean resources and uses as well as public trust resources that are within the jurisdiction of the Commission.

Due to the adverse environmental effects from OTC at coastal power plants that impact coastal and ocean resources and uses, as well as adverse impacts to public trust resources, that are within the jurisdiction of the Commission, on April 17, 2006, the Commission adopted a Resolution regarding "Once-Through Cooling in California Power Plants". However, the California Office of Administrative Law in 2006, OAL Determination No. 2, rendered the Resolution void for procedural reasons.

Section 316(b) of the Clean Water Act is a federal statute that is used by the U.S. Environmental Protection Agency and authorized States to develop regulations regarding cooling water intakes. The State Water Resources Control Board (Water Board) is currently in the process of developing 316(b) regulations and is preparing an environmental analysis and recommendations for adoption concerning the State's policy on the best available technology for OTC power plants. The Water Board staff's recommendations are anticipated to be considered at a public hearing sometime in 2008. A federal court found last year that the federal 316(b) regulations were substantially inconsistent with Section 316(b) and did not adequately protect the environment.

On May 10, 2007, the Commission authorized a 20-year General Lease – Industrial Use No. PRC 8727.1, to Cabrillo for the continued use and maintenance of existing intake and outfall structures, for the use as components of an OTC system associated with the upland Encina Power Plant and for the discharge of water from an existing permitted upland desalination test facility. As a result of the Commission's concerns over the impacts of OTC, Cabrillo's lease contains special language that assures that Cabrillo will be in compliance with various regulations governing the use of facilities involving intake of seawater, including but not limited to, the Clean Water Act, Section 316 (b) and federal and

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state regulations. The existing lease allows the Commission to modify the terms and conditions of the lease should that become necessary based on changes to the technology of cooling for power plants that may be required in their authorized capacities by other governmental regulatory agencies.

The following are pertinent provisions contained in Cabrillo's OTC Lease:

- a. Cabrillo is required to provide an annual written report to the Commission identifying conditions imposed upon it by other agencies pursuant to Federal and State laws including the Federal Clean Water Act, section 316(b) and California's Porter-Cologne Water Quality Act. The report shall indicate and provide evidence of Cabrillo's full compliance or engagement in an agency-directed process to achieve full compliance with the identified imposed conditions.
- b. The Commission will conduct a public hearing five years after the effective date of the lease in order to publicly review and evaluate Cabrillo's compliance with the terms of the lease as provided for in Section 4, Paragraph 6, including, but not limited to, compliance with the federal Clean Water Act, section 316 (b) and California's Porter-Cologne Water Quality Control Act.
- c. Cabrillo agrees to continue periodic maintenance dredging of the entrance and outer basin of Agua Hedionda Lagoon consistent with the provisions of existing Lease PRC 932.1, including amendments thereto, issued by the Commission for placement of dredged spoils. Such maintenance dredging shall continue for so long as the existing power plant requires cooling water from the Lagoon.

4) RELATIONSHIP OF DESALINATION TO OTC

As stated, OTC impacts for power plant operations and desalination operations are similar. Seawater intake for desalination purposes, in some cases, decreases mortality of aquatic organisms impinged on the intake screens due to lower flow rates, but may increase effects on aquatic organisms due to higher rates of salt brine in the discharge water. Both operations are similar in that organisms will be entrained within the system. The extent of the impacts of each operation are primarily dependent upon flow rates, water temperatures used for cooling the power generators and water temperatures used in cleaning

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organisms attached to the interior walls of the pipes utilized for intake, process and discharge of seawater.

The principal benefit afforded to desalination projects located with power plants comes from use of the power plants discharged cooling water. The desalination facility does not have to pay for construction of new intake and discharge facilities. There is an additional economy because feed water has already been pumped out of the ocean by the power plant. Finally, the desalination facility is not imposing an additional entrainment and impingement impact when it uses the water discharged by a power plant.

The Commission adopted the OTC resolution last year not out of concern over any one power plant but because of the cumulative impact of California's coastal power plants. According to information provided by the California Energy Commission in a June 2005 Staff Report entitled "Issues and Environmental Impacts Associated with Once-Through Cooling at California Coastal Power Plants", there are 21 coastal plants that utilize OTC systems with cumulative cooling water intake flow estimated at over 16 billion gallons per day that generate approximately 24,000 megawatts of power annually (Exhibit C).

According to "Desalination, with a Grain of Salt – A California Perspective" prepared by the Pacific Institute, June 2006, there are ten existing and 16 proposed desalination facilities along the coast of California. If these desalination facilities are required to dilute their brine discharge to the same level as the San Diego Regional Water Quality Control Board has required of the Carlsbad facility, staff has estimated that the intake of sea water required for these plants would be 1.75 to 2.75 billion gallons per day (Exhibit D).

At 304 MGD, Poseidon's Carlsbad facility diverts less than 2 percent and all of the planned and existing desalination facilities listed in the 2006 report would divert only about 14 percent, of the ocean water diverted by the state's coastal power plants. Thus, in the near future, the cumulative impact of all anticipated desalination facilities does not come close to the impact of the power plants.

However, the anticipated new 316(b) regulations adopted by both state and federal agencies and the trend towards repowering existing power plants with generating technology that does not rely on OTC is likely to reduce the impacts from power plants. For example, both the El Segundo power plant and the Cabrillo plant associated with the CDP, plan to reduce or eliminate OTC. Conversely, should the Poseidon desalination facility be successful, many more

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such facilities could be proposed and, in the long run, entrainment and impingement impacts from these facilities could surpass those of power plants.

Section 316(b) and the implementing regulations adopted by the US EPA and the State Water Resources Control Board apply only to power plants and not to desalination facilities. Technology developed to meet those regulations may help reduce the entrainment and impingement impacts from desalination facilities. Several of the mitigation measures proposed by Commission staff to be included in the lease provisions and discussed below will require Poseidon to add future technology if it will reduce these impacts. However, recent informal conversations with State Board staff suggest that the 316(b) regulations now be drafted for the Board will focus on cooling towers and similar technology that will eliminate OTC rather than reduce its impacts. This technology would not be applicable to desalination facilities.

5) MITIGATION OF ENTRAINMENT AND IMPINGEMENT AT POSEIDON'S CARLSBAD FACILITY

As a condition in Poseidon's NPDES permit, Poseidon Resources is required to submit a Flow, Entrainment and Impingement Minimization Plan (Flow Plan) to the Water Board. This Flow Plan requires that Poseidon Resources submit acute toxicity testing data and a proposal for achieving the best technology available to minimize impacts to marine life. The Flow Plan will give the Water Board the ability to accept or reject mitigation measures offered by Poseidon Resources for potential operating impacts to marine life within the five-year period authorized by the NPDES permit that will expire October 1, 2011.

The Flow Plan has been completed and submitted to the Water Board. The Flow Plan shows an impingement loss of 1.9 pounds biomass daily and an entrainment loss of 12.2 percent of annually produced larvae in the Agua Hedionda Lagoon. The latter was used to generate the 37 acre wetland restoration proposal - 12.2 percent of the 302 acre lagoon and mudflats is 36.8 acres. Among other things, it proposes to restore 37 acres of wetlands in tidal areas. This is the amount of wetlands calculated by Poseidon's consultants as necessary to provide the habitat to produce the ocean life that would be lost due to the desalination plants intake of ocean water. Water Board staff has indicated that it will solicit comments from State and federal fish and wildlife resource agencies prior to recommending further action by the Water Board on Poseidon Resources' proposed Flow Plan. Poseidon Resources cannot begin use of the lease premises until the Flow Plan is approved by the Water Board.

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Commission staff is proposing several lease provisions to address entrainment and impingement. These provisions:

- 1) Require Poseidon to restore and maintain at least the 37 acres of wetlands proposed for restoration in its Flow Plan and a higher acreage if required by the Water Board.
- 2) Require Poseidon to use best available design, technology and mitigation measures at all times to minimize impacts. This would require Poseidon to add newly developed equipment and technology if they are developed later in the lease.
- 3) Propose that the Commission hold a public hearing five years into the lease to review compliance with the lease and other agency's requirements.
- 4) Require Poseidon to pay for an independent consultant hired by the Commission to conduct an environment review ten years into the lease to analyze all environmental impacts from the desalination facility and to make all reasonable modifications directed by the Commission as a consequence of the review.
- 5) Require Poseidon to provide monetary consideration for environmental damage caused by use of the lease.

GREENHOUSE GAS EMISSIONS ASSOCIATED WITH THE PROJECT

Prepared prior to enactment of AB 32, which establishes a comprehensive greenhouse gas reduction program for California, the Final EIR certified by the City of Carlsbad in 2006 did not include an analysis of greenhouse gas (GHG) emissions. Staff has prepared a rough analysis based on the best available, but in some cases incomplete, information. This analysis examined the GHG emissions that could be generated from the proposed Carlsbad Desalination Plant (CDP) and compared them with the emissions associated with the current Carlsbad water supply, which is from the State Water Project (SWP) and the Colorado River Aqueduct (CRA). Commission staff worked with staff from the Coastal Commission, the California Energy Commission and others in generating this analysis.

The data obtained by staff from different sources varied in the amount of CO₂ produced by the state's mix of generating sources. For its comparison of emissions from the current water supply and the CDP, staff used average CO₂ emissions generated from combined-cycle gas-fired generators such as those used by San Diego Gas and Electric Company. The *Final Report* for the

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Updated Macroeconomic Analysis of Climate Strategies Presented in the March 2006 Climate Action Team Report, October 15, 2007, estimates 815 lbs CO₂/megawatt hour (MGH) are produced from a combined cycle gas facility. Using this figure, the CDP was calculated to emit approximately 101,270.93 metric tons of CO₂ per year to produce 50 MGD of fresh water. This compares to 56,309.4 metric tons of CO₂ per year that would be generated for the same amount of water from the combined delivery of water from the CRA and the SWP. However, it should be noted that the totals for both sources is probably low due to energy transmission losses, energy mixes provided by generators having higher CO₂ emissions, and other operations that could not be analyzed due to a lack of information regarding energy use. Assuming that the fresh water produced by the CDP will replace imported water, the CDP would result in a net increase of 44,961.53 metric tons of CO₂ per year.

Poseidon Resources has assumed that water from the CDP would replace the water currently coming into the area from the CRA and SWP. However, if water produced by the CDP represents an additional source rather than a replacement source, the project would increase the carbon footprint in the region by 101,270.93 metric tons of CO₂ per year.

Supporting documentation for the analysis discussed above is included as Exhibit B, Greenhouse Gas Emissions Analysis.

REPOWERING OF THE CABRILLO POWER PLANT

On September 14, 2007, the Carlsbad Energy Center LLC (an indirect wholly owned subsidiary of NRG Energy, Inc. which also owns Cabrillo Power I, LLC) submitted an application to the California Energy Commission for certification to develop a 558 megawatt gross combined-cycle thermal power plant at the Encina Power Station in the city of Carlsbad. This project would close Units 1, 2, and 3 OTC power units utilized by the Cabrillo power plant and install new generators that utilize a "closed cycle" cooling system. This system would use a cooling tower and reclaimed water and potable water supplied by the city of Carlsbad instead of the existing seawater intake and discharge channels authorized by the Commission. Units 4 and 5 would continue to be operated by Cabrillo on an "as needed" basis by contract with the California Independent System Operator. These units would continue to need OTC to operate

Prior to certification of the EIR for this project, the city of Carlsbad provided a response to public comments addressing the issue of Poseidon's operation of

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Cabrillo's intake structures during periods when Cabrillo would not be operating the intake or discharge of seawater for the purpose of generating electrical power. Carlsbad's FEIR analysis concludes that operation of the desalination facility without the power plant would not generate significant impacts.

Therefore, the FEIR addressed the consequences of the discontinuance of the use of OTC by the power plant that may occur as a result of the repowering. In fact, operation of the OTC facilities by the power plant during the first 6 months of 2007 averaged 124 MGD, much less than will be required by the desalination facility.

OTHER PERTINENT INFORMATION:

Poseidon Resources has agreed to provide a Performance Deposit in the amount of \$1,000,000 in addition to the \$500,000 bond already posted by Cabrillo that will ensure the financial wherewithal to accomplish restoration of the lease premises in the event that the facilities are no longer being used and to ensure compliance with all of the terms of the lease. This includes removal of the jetties at the mouth of the Agua Hedionda Lagoon and at the outfall channel. Additionally, a parent guaranty will be provided by Poseidon Water LLC to ensure Poseidon Resources' compliance with the terms of the lease.

Poseidon Resources must provide the Performance Deposit and parent guaranty no later than October 30, 2008. The amendment will not be executed by Lessor until after those items are provided.

Commission staff has received many letters of support for favorable consideration of the proposed desalination project from a variety of sources including, but not limited to, local interest groups, members of the California Legislature, various water districts and water agencies, water-dependent businesses operating in Agua Hedionda Lagoon, local homeowner's associations, union representatives, and various San Diego city and county businesses and administrative entities.

In addition, Commission staff has received over 1,400 e-mails from the general public in opposition to the project as well as letters of opposition from the Coast Law Group, attorneys representing the Surfrider Foundation and the San Diego Coast Keeper, indicating that a new EIR or supplemental EIR is necessary as previous environmental documents relied on a more consistent OTC operational water flow. They suggest that the proposed desalination plant cannot rely consistently on water from OTC; therefore, a subsequent EIR should consider

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whether the desalination plant should intake or discharge ocean water into state tidelands at all.

On May 3, 2006, the City of Carlsbad, acting as Lead Agency under CEQA, certified EIR 03-05 and a Mitigation Monitoring Program for the proposed project. The CSLC staff has reviewed such document and Mitigation Monitoring Program adopted by the lead agency. The CSLC will be acting as a Responsible Agency under CEQA and, as such, must generally use the EIR certified by the Lead Agency. Section 15162 of the CEQA Guidelines provides the only criteria under which a Responsible Agency may prepare a subsequent or supplemental EIR, and those relate essentially to major changes in the project or in the circumstances under which the project is built or to address new information of substantial importance. In this case, EIR 03-05 did address impacts in the event that the power plant no longer needed cooling water and that the proposed desalination project is to draw directly all the seawater it needs. Preparation of a supplemental or subsequent EIR would therefore not appear to be permitted under Section 15162 of the CEQA Guidelines.

Findings made in conformance with the State CEQA Guidelines (Title 14, California Code of Regulations, Section 15091 and 15096) are contained in Exhibit B, attached hereto.

A Statement of Overriding Considerations made in conformance with the State CEQA Guidelines (Title 14, California Code of Regulations, Section 15093) is contained in Exhibit B, attached hereto.

This activity involves lands identified as possessing significant environmental values pursuant to Public Resources Code sections 6370, et seq. Based upon the staff's consultation with the persons nominating such lands and through the CEQA review process, it is the staff's opinion that the project, as proposed, is consistent with its use classification.

APPROVALS OBTAINED:

City of Carlsbad, the California Regional Water Quality Control Board, and the Department of Health Services

FURTHER APPROVALS REQUIRED:

California Coastal Commission

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EXHIBITS:

- A. Site and Location Map
- B. Greenhouse Gas Emissions Analysis
- C. California Map of Existing and Proposed Power Plants/Co-Located Desalination Plants
- D. Proposed Desalination Plants in California as of Spring 2006
- E. Table of Entrainment Impacts of California Power Plants

PERMIT STREAMLINING ACT DEADLINE:

Not established

RECOMMENDED ACTION:

IT IS RECOMMENDED THAT THE COMMISSION:

CEQA FINDING:

FIND THAT AN EIR WAS PREPARED AND CERTIFIED FOR THIS PROJECT BY THE CITY OF CARLSBAD AND THAT THE COMMISSION HAS REVIEWED AND CONSIDERED THE INFORMATION CONTAINED THEREIN.

ADOPT THE FINDINGS MADE IN CONFORMANCE WITH TITLE 14, CALIFORNIA CODE OF REGULATIONS, SECTIONS 15091 AND 15096 (h), AS CONTAINED ON FILE IN THE SACRAMENTO OFFICE OF THE CALIFORNIA STATE LANDS COMMISSION.

ADOPT THE MITIGATION MONITORING PROGRAM, AS CONTAINED ON FILE IN THE SACRAMENTO OFFICE OF THE CALIFORNIA STATE LANDS COMMISSION.

ADOPT THE STATEMENT OF OVERRIDING CONSIDERATIONS MADE IN CONFORMANCE WITH TITLE 14, CALIFORNIA CODE OF REGULATIONS, SECTION 15093, AS CONTAINED ON FILE IN THE SACRAMENTO OFFICE OF THE CALIFORNIA STATE LANDS COMMISSION.

SIGNIFICANT LANDS INVENTORY FINDING:

FIND THAT THIS ACTIVITY IS CONSISTENT WITH THE USE CLASSIFICATION DESIGNATED BY THE COMMISSION FOR THE LAND PURSUANT TO PUBLIC RESOURCES CODE SECTIONS 6370, ET SEQ.

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AUTHORIZATION:

AUTHORIZE THE AMENDMENT OF LEASE NO. PRC 8727.1, A GENERAL LEASE – INDUSTRIAL USE, OF LANDS SHOWN ON EXHIBIT A ATTACHED AND BY THIS REFERENCE MADE A PART HEREOF, EFFECTIVE OCTOBER 30, 2007; TO INCLUDE, BUT NOT BE LIMITED TO, THE FOLLOWING:

- a. THE BASIC PROVISIONS IS AMENDED TO RECOGNIZE THAT POSEIDON RESOURCES CHANNELSIDE LLC AND CABRILLO POWER I LLC ARE CO-LESSEES;
- b. THE LAND USE OR PURPOSE IS AMENDED TO ALLOW THE INTAKE OF SEA WATER AND THE COMMINGLING OF BRINE WATER DISCHARGE FOR THE DESALINATION FACILITY AS DESCRIBED IN SECTION 3 OF THE LEASE PRC 8727.1;
- c. THE CONSIDERATION IS AMENDED TO REQUIRE THAT POSEIDON RESOURCES SHALL PROVIDE SUCH OTHER CONSIDERATION AS MAY BE DEEMED BY THE COMMISSION TO BE IN THE BEST INTEREST OF THE STATE, WHICH INCLUDES, BUT IS NOT LIMITED TO, THE MONETARY VALUE OF ACTUAL OR POTENTIAL ENVIRONMENTAL DAMAGE ANTICIPATED FROM THE PROPOSED USE OF THE LEASE PREMISES AND THAT SUCH VALUE MAY BE DETERMINED AND CONSIDERED BY THE COMMISSION PURSUANT TO SECTION 4, PARAGRAPH 2. CONSIDERATION (b) MODIFICATION IN THE LEASE;
- d. THE SPECIAL PROVISIONS IS AMENDED TO REQUIRE THAT:
 - i. POSEIDON RESOURCES AND CABRILLO, HEREAFTER REFERRED TO AS "CO-LESSEES" , OR INDIVIDUALS, SHALL BE REQUIRED JOINTLY AND SEVERALLY TO COMPLY WITH ALL OF THE RESERVATIONS, TERMS, COVENANTS AND CONDITIONS OF THIS LEASE SO LONG AS THE SEWATER INTAKE CHANNELS AND JETTIES ARE NEEDED TO PROVIDE OCEAN WATER FOR THE PRIMARY PURPOSE OF GENERATING ELECTRICAL POWER, PROVIDED, HOWEVER, THAT: (a) CABRILLO SHALL BE RESPONSIBLE FOR OBLIGATIONS UNDER THE LEASE PERTAINING TO ITS POWER PLANT FACILITY; (b) POSEIDON RESOURCES SHALL BE RESPONSIBLE FOR OBLIGATIONS UNDER THE LEASE PERTAINING TO ITS DESALINATION FACILITY; AND (c) IF THERE IS A DISAGREEMENT BETWEEN POSEIDON RESOURCES AND CABRILLO AS TO THEIR RESPECTIVE

CALENDAR ITEM NO. 48 (CONT'D)

RESPONSIBILITIES UNDER THE LEASE, THAT DISPUTE SHALL BE RESOLVED BY LESSOR.

- ii. POSEIDON RESOURCES, AS A SEPARATE OBLIGATION, SHALL PROVIDE 37 ACRES, OR ANY GREATER AMOUNT REQUIRED BY ANOTHER FEDERAL, STATE OR LOCAL REGULATORY AGENCY, OR MARINE WETLANDS RESTORATION, AS MITIGATION FOR THE UNAVOIDABLE INTAKE (IMPINGEMENT AND ENTRAINMENT) AND MORTALITY OF MARINE LIFE ASSOCIATED WITH THE USE OF THE LEASE PREMISES FOR THE DESALINATION FACILITY OPERATION. POSEIDON RESOURCES, AS A SEPARATE OBLIGATION, SHALL ALSO BE RESPONSIBLE FOR PROVIDING FUNDS TO OPERATE AND MAINTAIN THE MARINE WETLANDS RESTORATION AREA FOR THE TERM OF THE LEASE OR AS OTHERWISE REQUIRED BY ANOTHER FEDERAL, STATE OR LOCAL REGULATORY AGENCY;
- iii. WITHOUT INTERFERENCE WITH, OR INTERRUPTION OF, POWER PLANT SCHEDULED OPERATIONS AND AT ITS SOLE COST AND EXPENSE, POSEIDON RESOURCES, AS A SEPARATE OBLIGATION, SHALL USE THE BEST AVAILABLE DESIGN, TECHNOLOGY, AND MITIGATION MEASURES AT ALL TIMES DURING WHICH THIS LEASE IS IN EFFECT TO MINIMIZE INTAKE (IMPINGEMENT AND ENTRAINMENT) AND MORTALITY OF ALL FORMS OF MARINE LIFE ASSOCIATED WITH THE OPERATION OF THE DESALINATION FACILITY AS DETERMINED BY THE SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD OR ANY OTHER FEDERAL, STATE OR LOCAL ENTITY;
- iv. POSEIDON RESOURCES, AS A SEPARATE OBLIGATION, SHALL PROVIDE NOTICE AND SUFFICIENT DETAILS 120 DAYS PRIOR TO ANY CHANGES IN OWNERSHIP OR ASSIGNMENT OF INTEREST AS DEFINED IN SECTION 4, PARAGRAPH 10 OF THE LEASE.;
- v. TEN YEARS FROM OCTOBER 30, 2007, LESSOR WILL UNDERTAKE AN ENVIRONMENTAL REVIEW OF THE ONGOING IMPACTS OF THE OPERATION OF THE DESALINATION FACILITY TO DETERMINE IF ADDITIONAL REQUIREMENTS PURSUANT TO PARAGRAPH iii, ABOVE ARE REQUIRED. LESSOR WILL HIRE A QUALIFIED INDEPENDENT ENVIRONMENTAL CONSULTANT AT THE

CALENDAR ITEM NO. 48 (CONT'D)

SOLE EXPENSE OF POSEIDON RESOURCES WITH THE INTENT TO ANALYZE ALL ENVIRONMENTAL EFFECTS OF FACILITY OPERATIONS AND ALTERNATIVE TECHNOLOGIES THAT MAY REDUCE ANY IMPACTS FOUND. LESSOR MAY REQUIRE, AND POSEIDON RESOURCES SHALL COMPLY WITH, SUCH ADDITIONAL REQUIREMENTS AS ARE REASONABLE AND AS ARE CONSISTENT WITH APPLICABLE STATE AND FEDERAL LAWS AND REGULATIONS AND AS LESSOR DETERMINES ARE APPROPRIATE IN LIGHT OF THE ENVIRONMENTAL REVIEW.

- vi. POSEIDON RESOURCES, AS A SEPARATE OBLIGATION, SHALL PROVIDE COPIES OF ALL REGULATORY MONITORING AND COMPLIANCE REPORTS PERTAINING TO THE OPERATION OF ITS DESALINATION FACILITY TO LESSOR AT THE TIME OF SUBMITTING SUCH REPORTS WITH ANY REGULATORY AGENCY;
- vii. POSEIDON RESOURCES, AS A SEPARATE OBLIGATION, SHALL PROVIDE LESSOR WITH A PERFORMANCE DEPOSIT IN THE AMOUNT OF \$1,000,000. AT ANY TIME DURING THE TERM OF THE LEASE, LESSOR MAY REQUIRE AN INCREASE IN THE AMOUNT OF THE PERFORMANCE DEPOSIT TO REFLECT ECONOMIC INFLATION OR TO COVER ANY ADDITIONAL AUTHORIZED IMPROVEMENTS, ALTERATIONS, OR PURPOSES OF ANY MODIFICATION OF RENTAL;
- viii. POSEIDON RESOURCES, AS A SEPARATE OBLIGATION, SHALL PROVIDE LESSOR WITH AN UNCONDITIONAL PARENT GUARANTY BY POSEIDON WATER LLC, IN A FORM APPROVED BY CSLC STAFF, FOR FULL PERFORMANCE BY POSEIDON OF ALL THE OBLIGATIONS UNDER THE LEASE;
- ix. PRIOR TO THE DESALINATION USE OF THE LEASE PREMISES, POSEIDON RESOURCES, AS A SEPARATE OBLIGATION, SHALL PROVIDE TO LESSOR A DETAILED REPORT OF COMPLIANCE WITH ORDER NO. R9-2006-0065, NPDES No. CA0109223, ADOPTED BY THE SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD, ON JUNE 14, 2006, AND BECAME EFFECTIVE ON OCTOBER 2006, AND SHALL EXPIRE ON OCTOBER 1, 2011;
- x. POSEIDON RESOURCES SHALL PROVIDE A WRITTEN REPORT TO THE COMMISSION, FOR USE AT A PUBLIC HEARING WITHIN FIVE YEARS OF THE EFFECTIVE DATE OF

CALENDAR ITEM NO. 48 (CONT'D)

THIS LEASE AMENDMENT, ON THE STATUS OF COMPLIANCE WITH ALL OF THE TERMS AND CONDITIONS OF THE LEASE;

- xi. IN THE EVENT THAT POSEIDON RESOURCES FAILS TO COMPLY WITH ANY OR ALL OF ITS SEPARATE OBLIGATIONS UNDER THIS LEASE, LESSOR MAY TERMINATE POSEIDON'S RIGHTS UNDER THIS LEASE WITHOUT AFFECTING ANY OR ALL OF CABRILLO'S RIGHTS OR OBLIGATIONS UNDER THIS LEASE;
 - xii. POSEIDON RESOURCES SHALL NOT MAKE ANY CHANGES IN USE OR OPERATION OF THE INTAKE CHANNELS AND JETTIES WITHOUT PRIOR AUTHORIZATION BY LESSOR;
 - xiii. AT ANY TIME AFTER CABRILLO NOTIFIES LESSOR IN WRITING THAT CABRILLO WILL NO LONGER BE USING THE FACILITIES ON THE LEASE PREMISES IN CONNECTION WITH THE PRODUCTION OF ELECTRICITY, CABRILLO MAY APPLY TO LESSOR FOR APPROVAL OF AN ASSIGNMENT OF ITS OBLIGATIONS UNDER THE LEASE TO POSEIDON RESOURCES. IN CONSIDERATION CABRILLO'S APPLICATION FOR APPROVAL OF AN ASSIGNMENT, LESSOR WILL TAKE INTO ACCOUNT POSEIDON RESOURCES' PAST PERFORMANCE AND THE LIKELIHOOD THAT POSEIDON RESOURCES COULD AND WOULD CARRY OUT ALL OBLIGATIONS UNDER THE LEASE AS SOLE LESSEE. IN THE EVENT THAT LESSOR FINDS THAT THERE IS A SUBSTANTIAL PROBABILITY THAT POSEIDON RESOURCES WOULD NOT OR COULD NOT CARRY OUT ALL SUCH OBLIGATIONS, THEN LESSOR MAY DISAPPROVE THE ASSIGNMENT IN WHICH CASE, AT CABRILLO'S OPTION, THE LEASE WOULD TERMINATE OR CABRILLO WOULD REMAIN AS CO-LESSEE.
- e. GENERAL PROVISIONS IS AMENDED AS FOLLOWS: PARAGRAPH 11, DEFAULT AND REMEDIES, (a) DEFAULT PARAGRAPH (4) IS HEREBY DELETED IN ITS ENTIRETY AND IS REPLACED WITH THE FOLLOWING:
- (4) CO-LESSEES' FAILURE TO OBTAIN, MAINTAIN AND COMPLY WITH ALL NECESSARY GOVERNMENTAL PERMITS OR OTHER ENTITLEMENTS;

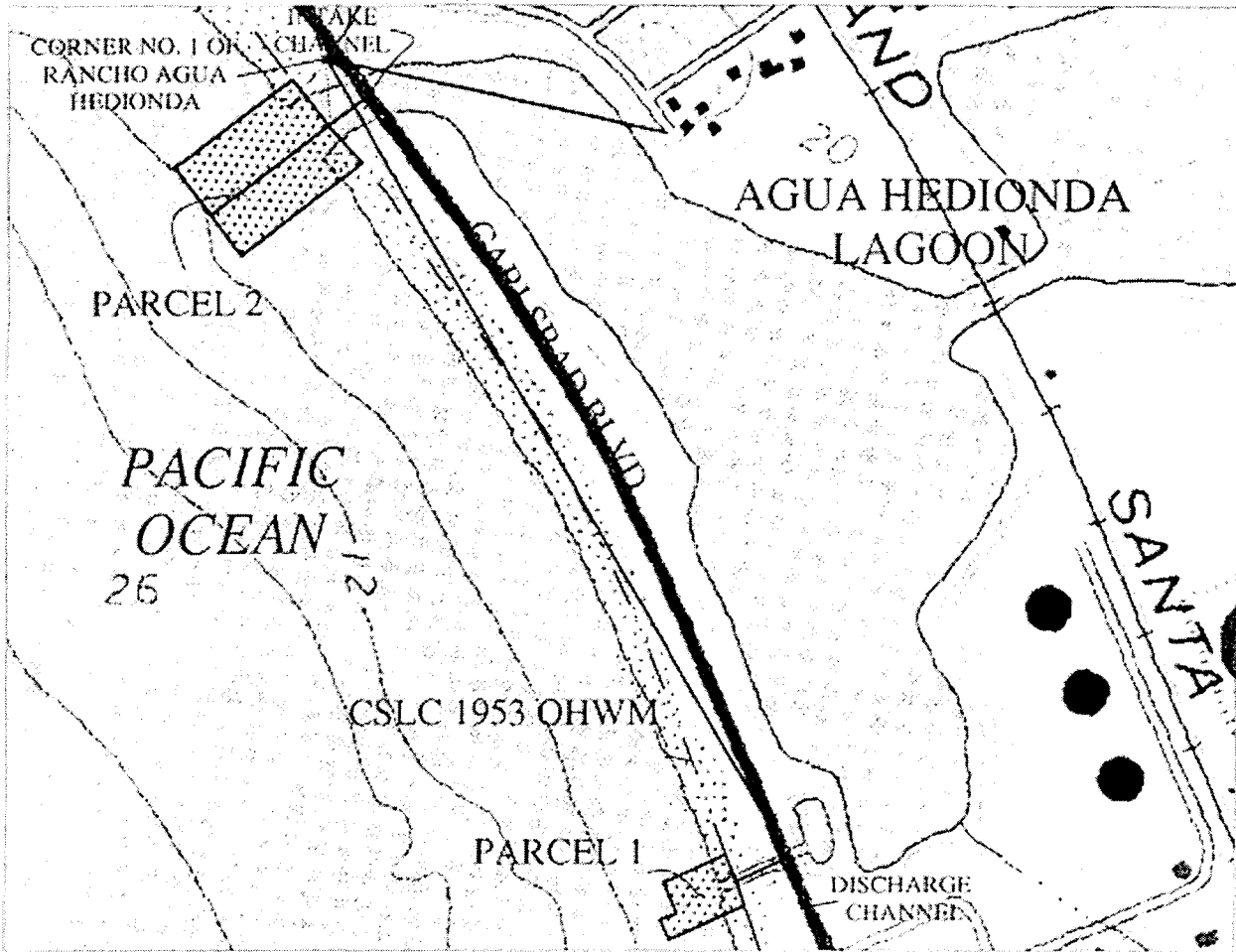
CALENDAR ITEM NO. 48 (CONT'D)

AS SET FORTH IN THE LEASE AMENDMENT WHICH IS ON FILE IN THE OFFICE OF THE STATE LANDS COMMISSION; ALL OTHER TERMS AND CONDITIONS OF THE LEASE WILL REMAIN IN EFFECT WITHOUT AMENDMENT.

- f. POSEIDON RESOURCES MUST PROVIDE THE PERFORMANCE DEPOSIT AND PARENT GUARANTY BY OCTOBER 30, 2008. ONLY THEN MAY COMMISSION STAFF EXECUTE THE LEASE AMENDMENT.

NO SCALE

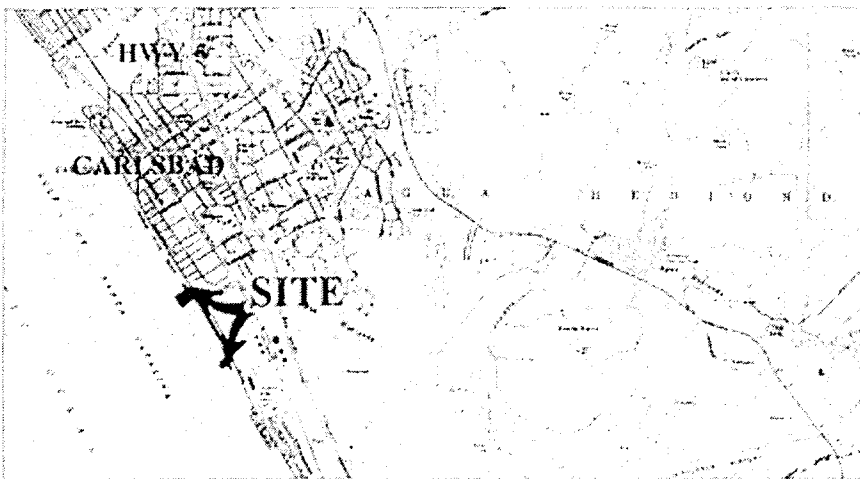
SITE



EXISTING GROIN STRUCTURES, AGUA HEDIONDA LAGOON

NO SCALE

LOCATION



MAP SOURCE: USGS QUAD

This Exhibit is solely for purposes of generally defining the lease premises, is based on unverified information provided by the Lessee or other parties and is not intended to be, nor shall it be construed as, a waiver or limitation of any State interest in the subject or any other property.

Exhibit A

PRC 8727
CABRILLO POWER I, LLC &
POSEIDON RESOURCES
(CHANNEL SIDE) LLC
INDUSTRIAL LEASE
SAN DIEGO COUNTY



MIP 12/1/06

EXHIBIT B: GREENHOUSE GAS EMISSIONS ANALYSIS

In preparing this analysis, numerous assumptions were made due to the wide range of variables that occur when considering greenhouse gas (GHG) emissions associated with the electrical energy generation required to transport and desalinate water. CSLC staff consulted with a number of agencies, particularly the California Energy Commission (CEC), to obtain the most credible information available. Based on advice provided by the CEC, staff prepared a range of greenhouse gas emissions scenarios for the proposed Carlsbad Desalination Plant (CDP). This range is calculated from a best case scenario of 690 pounds of CO₂ per megawatt hour (lbs CO₂/MWH) to a worst case scenario of 1100 lbs CO₂/MWH. The amount of CO₂ emissions produced is a function of the manner in which electricity is generated (coal, combined-cycle natural gas-fired, renewables, etc.)

In order to determine the amount of GHG emissions, the amount of electricity that would be required to move and desalinate water was determined based on the pumping regime that Poseidon Resources states they are most likely to use (Scenario Preference based on Revised Flow, Impingement and Entrainment Plan submitted to the San Diego Regional Water Quality Control Board, June 2007). Poseidon Resources also states that they intend to obtain electricity from the San Diego Gas and Electric (SDG&E) power company's grid. Currently, SDG&E's energy is primarily generated by combined-cycle natural gas-fired plants. Using data from the *Final Report for the Updated Macroeconomic Analysis of Climate Strategies Presented in the March 2006 Climate Action Team Report*, released October 15, 2007, staff obtained an amount of 815 pounds (lbs) of carbon dioxide (CO₂) per MWH as the typical emission rate from a combined-cycle generator.

In addition, staff used 815 lbs of CO₂ per MWH to calculate the emissions per acre foot for the State Water Project (SWP) and the Colorado River Aqueduct (CRA), as well as the CDP. Staff also used information provided in an October 16th letter from the Coastal Law Group, which used 2.0 megawatt hours (MWH) and 3.2 MWH per acre foot of water for the CRA and SWP respectively, in the emission calculations for those facilities (Table 4). However, information was recently provided by CEC staff that states the MWH per AF for the SWP could be as high as 5 MWH.

Regarding energy loading for the CDP, staff used the 30 MWH provided in the Final EIR for this project that was certified by the city of Carlsbad in 2006 to calculate GHG emissions for that facility (Table 3). Poseidon has indicated a range of 29.3 to 35 MWH. However, the 30 MWH considered in the Final EIR does not account for any increase or reduction of emissions that may occur due to the loss of heated intake water into the CDP. Electrical loadings (for the EPS intake pumps Tables 1 and 2) were provided through discussions with engineers at NRG (EPS's owners). CO₂ emissions were calculated by CSLC staff based on the electrical demands provided by NRG (Table 3).

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As shown on Table 3, given the assumptions discussed above, the CDP is estimated to generate approximately 101,270.93 metric tons of CO₂ per year when fully operational. This compares to 56,309.4 metric tons of CO₂ per year currently being generated by the import of the same amount of fresh water from the SWP and CRA (Table 4). Assuming that the fresh water produced by Poseidon replaces imported water, the CDP would result in a net carbon footprint increase of 44,961.53 metric tons of CO₂ per year. However, if the CDP water is additive, then the project would increase the carbon footprint in the region by 101,270.93 metric tons of CO₂ per year.

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Table 1 ³ Encina Power Station Intake Pumping Rates and Energy Use by Generating Unit (Assuming Two Intake Pumps Per Unit)						
Unit No.	Gallons/Minute (GPM)	Million Gallons/Hour (MGH)	Million Gallons/Day (MGD)	Acre Feet/Day (AFD)	Kilowatts/Hour (KWH) ¹ per Single Pump	KWH/Day per 2 Pumps
1	48,000	2.88	69.12	212.12	175	8,400
2	48,000	2.88	69.12	212.12	175	8,400
3	48,000	2.88	69.12	212.12	175	8,400
4	200,000	12.00	288.00	883.84	600	28,800
5	208,000	12.48	299.52	919.19	950	45,600

Table 2 ³ Energy Consumption and Carbon Foot Print for each Encina Generating Unit (Assuming Two Intake Pumps Per Unit)		
Unit No.	KWH/AF (Megawatt/Hour = MWH) (KWH ÷ 1000 = MWH)	Total KWH Used/Day (MWH)
1	39.60 (0.03 MWH/AF)	8,399.95 (8.40 MWH)
2	39.60 (0.03 MWH/AF)	8,399.95 (8.40 MWH)
3	39.60 (0.03 MWH/AF)	8,399.95 (8.40 MWH)
4²	34.54 (0.03 MWH/AF)	30,527.83 (30.53 MWH)
5	49.61 (0.05 MWH/AF)	45,601.02 (45.60 MWH)

¹ KWH energy use for pumps was established during discussions with an engineer from NRG (Owners of the Encina Power Station). Actual loading for pumping units could have some slight variation depending on updates/repairs of the units.

² Assumes additional pumping needed to meet the CDP's water requirement of 304 MGD.

³ Tables 1 and 2 show the KWH/day for the stand alone operations of the CDP based on using pumps from the Encina Generating Unit Number 4.

Table 3

**Changes in CO₂/MWH Based on Different Energy Generation Mixes
For Unit 4 Shown on Table 2 and the Desalination Operations**

Lbs CO ₂ /MWH	Power Plant Intake Pumps - Unit 4 Metric Tons CO ₂ /Year (MWH/Day x [Lbs CO ₂ /MWH] x 365 Days)/2204.62	Carlsbad Desal Plant (CDP) Operations Metric Tons CO ₂ /Year ² (30 MWH x 24hrs x [Lbs CO ₂ /MWH] x 365 days)/2204.62	Total Metric Tons Per Year CO ₂ Preferred Flow Plan ³ Scenario Intake Pump - 4
690.00 ⁴	3,487.67	82,250.91	85,738.57
804.54 ⁵	4,066.62	95,904.56	99,971.18
815.00	4,119.49	97,151.44	101,270.93
879.00 ⁶	4,442.98	104,780.51	109,223.49
1100.00 ⁷	5,560.05	131,124.64	136,684.69

²30 MWH based on energy use analysis in the Carlsbad 2006 FEIR. However, this energy use is based off of a preheated source being used for the reverse osmosis process and not a cold source. Energy use could increase depending on temperature of the intake water.

³ Scenario Preference based on Revised Flow, Impingement and Entrainment Plan submitted to the San Diego Regional Water Quality Control Board, June 2007.

⁴ UPDATED MACROECONOMIC ANALYSIS OF CLIMATE STRATEGIES PRESENTED IN THE MARCH 2006 CLIMATE ACTION TEAM REPORT FINAL REPORT, October 15, 2007.

⁵ Figure based on table provided by <http://www.climateregistry.org/docs/PROTOCOLS/California%20Registry%20Power-Utility%20Reporting%20Protocol%20Version%201.0%20APRIL%202005.pdf>

⁶ Figure based on calculation provided by <http://www.epa.gov/cleanenergy/powerprofiler.htm> Figure based on table provided by <http://www.climateregistry.org/docs/PROTOCOLS/California%20Registry%20Power-Utility%20Reporting%20Protocol%20Version%201.0%20APRIL%202005.pdf>

⁷ Figure based on Senate Bill 1368 (Perata) – The CPUC adopted 1,100 lbs CO₂/MWh as its Emissions Performance Standard under Senate Bill 1368 for long-term investments by investor-owned utilities IOUs in the procurement of electricity. For a copy of SB 1368 go to http://www.energy.ca.gov/ghgstandards/documents/sb_1368_bill_20060929_chaptered.pdf.

Table 4
Metric Tons CO₂/MWH/Acre Foot of Water (AF)/Year
For 56 Thousand Acre Feet/Year State Water Project (SWP) and Colorado River Aqueduct (CRA)

Facility	% AF Delivered by Facility ¹	MWH/AF	Total MWH	Metric Tons CO ₂ /Year ² (Total MWH X 815 lbs CO ₂ /MWH) ÷ 2204.62
SWP	33,600.0	3.2	107,520.0	39,747.8
CRA	22,400.0	2.0	44,800.0	16,561.6
Total	56,000.0	N/A	152,320.0	56,309.4

¹ Staff used a 60/40 percentage split for water provided by the SWP/CRA respectively. This information was taken from the Poseidon document "Energy Use and Greenhouse Analysis" that was provided to the Coastal Commission on October 9, 2007.

² Based on average of 815 lbs CO₂/MWH for combined cycle generation from UPDATED MACROECONOMIC ANALYSIS OF CLIMATE STRATEGIES PRESENTED IN THE MARCH 2006 CLIMATE ACTION TEAM REPORT FINAL REPORT. Actual CO₂ emissions for water deliveries would vary and may likely be higher than stated in the table. Figures to be use for general reference purposes only.

DEL NORTE SISKIYOU

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EXHIBIT C

HUMBOLDT TRINITY SHASTA LASSEN

TEHAMA PLUMAS

MENDOCINO GLENN BUTTE

SIERRA

COLUSA YUBA NEVADA

LAKE SUTTER PLACER

SONOMA YOLO EL DORADO

NAPA SACRAMENTO ALPINE

MARIN SOLANO AMADOR MONO

San Francisco SAN FRANCISCO SAN JOAQUIN CALAVERAS TUOLUMNE

CONTRA COSTA ALAMEDA STANISLAUS MARIPOSA

SAN MATEO SANTA CLARA MERCED MADERA INYO

SANTA CRUZ SAN BENITO FRESNO TULARE

7 Proposed

MONTEREY KINGS

SAN LUIS OBISPO KERN SAN BERNARDINO

3

SANTA BARBARA VENTURA LOS ANGELES

Los Angeles 3 5 Proposed
Huntington Beach Poseidon Resources

San Diego Carlsbad Poseidon Resources

San Diego 3 Proposed

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PROPOSED DESALINATION PLANTS IN CALIFORNIA AS OF SPRING 2006¹

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Operator	Location	Max Capacity/ MGD	Ocean water intake necessary to produce design output based on 50% freshwater output from feed water (MGD)	Total ocean water intake (includes 4:1 Dilution Rate of brine, comparable to the CDP (MGD))
Marin Municipal Water District	San Rafael	10-15	20-30	60-90
East Bay Municipal Utility District/San Francisco Public Utilities Commission/Contra Costa Water District/Santa Clara Valley Water District	Pittsburg/Oakland/Oceanside	20-80	40-160	120-480
East Bay Municipal Utility District	Crockett	1.5	3.0	9
City of Santa Cruz	Santa Cruz	2.5, possible expansion to 4.5	5-10	15-27
California American Water Company	Moss Landing	11-12	22-24	66-72
Pajaro-Sunny Mesa/Poseidon	Moss Landing	20-25	40-50	120-150
City of Sand City	Sand City	0.3	0.6	1.8
Monterey Peninsula Water Management District	Sand City	7.5	15	45
Marina Coast Water District	Marina	1.3	2.6	7.8
Ocean View Plaza	Cannery Row	0.05	0.1	0.3
Cambria Community Services District/Department of the Army	Cambria	0.4	0.8	2.4
Arroyo Grande/Grover Beach/Oceano Community Services District	Oceano	1.9	3.8	11.4
Los Angeles Department of Water and Power	Playa Del Rey	12-25	24-50	72-150
West Basin Municipal Water District	El Segundo	20	40	120
Long Beach Water Department	Long Beach	8.9	17.8	53.4
Poseidon Resources	Huntington Beach	50	100	300
Municipal Water District of Orange County	Dana Point	25	50	150
San Diego County Water	Camp Pendleton	50, expanding to 100	100-200	300-600

Exhibit D

PROPOSED DESALINATION PLANTS IN CALIFORNIA AS OF SPRING 2006¹

San Diego County Water Authority/Municipal Water District of Orange County	Camp Pendleton	50, expanding to 100	100-200	300-600
Poseidon Resources	Carlsbad	50, possible expansion to 80	100-160	300-480

¹ First three columns are adapted from Table ES1 in "Desalination, with a Grain of Salt – A California Perspective" prepared by the Pacific Institute, June 2006.

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**Table 1 Entrainment Impacts of California Power Plants
Data from AEG (2002) and Foster (2005) unless otherwise noted
ND = no data or no accurate data available * = fished species**

Power Plant	Intake Environment	Generation Capacity (MW)	Intake Volumes MGD	Density Larvae (/1000m³) & # taxa entrained	Most Abundant Entrained Species	Mitigation for Entrainment Impacts⁺
1. Alamitos	South Coast - South Palos Verdes Region; shore in bay/harbor	2083	1275 (4.817)	ND	ND	ND
2. Contra Costa	San Francisco Bay-Delta	680	341 (1.291)	ND	ND	ND
3. Diablo Canyon ^A (nuclear)	Central Coast; shore in open coast rocky cove	2200	2540 (9.615)	Fish density: 465 #taxa: 218 Crabs density: 10,960 #taxa: 9 Urchins density: 593 #taxa: 2	*Rockfishes, Clinid Kelpfishes, Blackeye Goby, Monkeyface Eel, Smoothead Sculpin, Snubnose Sculpin, *White Croaker, *Cancer Crabs, *Yellow Rock Crab, Purple Sea Urchin	120 - 240 hectares (296-593 acres) of rock reef
4. El Segundo	South Coast - Santa Monica Bay; subtidal open coast sand bottom	1020	605 (2.29)	ND	ND	ND
5. Encina	South Coast; shore in bay/estuary	965	857 (3.244)	ND	ND	ND
6. Haynes	South Coast - South Palos Verdes Region; shore in bay/harbor	1570	1271 (4.811)	ND	ND	ND
7. Humboldt Bay	North Coast; shore in estuary	135	78 (0.2953)	ND	ND	ND
8. Hunters Point	South San Francisco Bay; shore of estuary	215	412 (1.560)	ND	ND	ND

Exhibit E

Table 1 (continued) Entrainment Impacts of California Power Plants
. Data from AEG (2002) and Foster (2005) unless otherwise noted.
ND = no data or no accurate data available. * = fished species

Power Plant	Intake Environment	Generation Capacity (MW)	Intake Volume (MGD)	Density Larvae (/1000m³) & # taxa entrained	Most Abundant Entrained Species	Mitigation for Entrainment Impacts*
9. Huntington Beach ^B	South Coast - South Palos Verdes Region; subtidal open coast sand bottom	880	507 (1.919)	Fish density: 407 #taxa: 53 Crabs density: 667 #taxa: 8	Gobies, *Anchovies *Spotfin Croaker, *White Croaker, *Queenfish, *"Croakers," Blennies, *Mole Crabs, *Cancer Crags	2.3 - 56.4 km of sandy coastline to 5 km offshore = 1,150 - 28,240 hectares (2,840 - 69,752 acres)
10. Long Beach	South Coast-South Palos Verdes Region; shore in harbor	577	261 (0.988)	ND	ND	ND
11. Los Angeles Harbor	South Coast - South Palos Verdes Region; shore in harbor	472	110 (0.4164)	ND	ND	ND
12. Mandalay	South Coast-Ventura Region; in harbor	577	255 (0.9653)	ND	ND	ND
13. Morro Bay ^C	Central Coast; shore in estuary/harbor	1002	668 (2.529)	Fish density: 590 #taxa: 92 Crabs density: 24 #taxa: 8 Clams & Mussels density: 1.8 x 10 ⁶ #taxa: >5	Gobies, Staghorn Sculpin, Blennies, Shadow Gobies, Jacksmelt, Blackeye Goby, Northern Lampfish, *Cancer Crabs, *Clams, *Mussels	93-307 hectares (230-759 acres) estuarine habitat

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Table 1 (continued) Entrainment Impacts of California Power Plants
Data from AEG (2002) and Foster (2005) unless otherwise noted.
ND = no data or no accurate data available. * = fished species

Power Plant	Intake Environment	Generation Capacity (MW)	Intake Volume (MGD)	Density Larvae (/1000m³) & # taxa entrained	Most Abundant Entrained Species	Mitigation for Entrainment Impacts*
14. Moss Landing ^D	Central Coast; shore in estuary/harbor	2538	1224 (4.633)	Fish density: 638 #taxa: 67 Crabs density: 3.9 #taxa: 8	Gobies, Bay Goby, Blackeye Goby, Pacific Staghorn Sculpin, Blennies, *White Croaker, *Pacific Herring	460 hectares (1135 acres) of estuarine wetlands
15. Ormond Beach	South Coast - Ventura Region: subtidal open coast sandy bottom	1500	688 (2.605)	ND	ND	ND
16. Pittsburg	San Francisco Bay-Delta	2029	1070 (4.050)	ND	ND	ND
17. Potrero ^E	South San Francisco Bay; shore in estuary	362	226 (0.8555)	Data incomplete	Gobies, Yellowfin Goby, Bay Goby, *Pacific Herring, *Northern Anchovy, *White Croaker, *Cancer Crabs, European Green Crab	357 hectares (882 acres) of estuarine habitat
18. Redondo Beach	South Coast - Santa Monica Bay; harbor	1310	881 (3.335)	ND	ND	ND
19. San Onofre ^F (nuclear)	South Coast; subtidal open coast sand bottom	2254	2580 (9.766)	Fish density: 1590	*Northern Anchovy, *White Croaker, *Queenfish, Gobies, Blennies, *Grunions & Smelts	60.7 hectares (150 acres) of estuarine wetlands

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**Table 1 (continued) Entrainment Impacts of California Power Plants.
Data from AEG (2002) and Foster (2005) unless otherwise noted.
ND = no data or no accurate data available. * = fished species**

Power Plant	Intake Environment	Generation Capacity (MW)	Intake Volume (MGD)	Density Larvae (/1000m³) & # taxa entrained	Most Abundant Entrained Species	Mitigation for Entrainment Impacts⁺
20. Scattergood	South Coast-Santa Monica Bay; subtidal open coast sand bottom	818	495 (1.874)	ND	ND	ND
21. South Bay ^c	South Coast-Southern San Diego Bay; shore in estuary	723	601 (2.275)	Fish density: 2,744 #taxa:44	Gobies, *Bay Anchovies, Blennies, Mudsuckers, Pipefish, Yellowfin Gobies	406 hectares (1003 acres) of estuarine habitat
TOTAL		23,910	16,925 (64.13)			

+ . Except for plant 19., based on Habitat Production Foregone (HPF), the area of habitat needed to replace larvae killed by entrainment. These areas vary in part because of the use of different PM values (e.g., PM average versus PM max.). The most appropriate value to use needs to be better resolved (see Recommendations, Appendix 2.)

A. Entrainment data from Tenera (2000a) and mitigation from CCRWQCB (2005) using average PM max.

B. Generation capacity, intake vol. and entrainment data from MBC/Tenera (2005) and preliminary mitigation estimate from using range of average PM max. to average PM max. 95 percent CI (Raimondi pers. comm.).

C. Generation capacity, intake vol. and fish and crab entrainment data from Tenera (2001a), clam densities from Geller (pers. comm.), mitigation from CCRWQCB (2004) using average PM and average PM max.

D. Entrainment data from Tenera (2000b), mitigation from Anderson & Foster (2000) using average PM.

E. Entrainment data from Tenera (2001b; Jan.-June 2001 data only). Mitigation calculated from data in Tenera (2001b) using average PM max = 0.0059 and area of source water habitat = 39,700 hectares.

F. Entrainment data from MRC (P. Raimondi, pers. comm.), mitigation data from CCC (1997)

G. Entrainment data from Duke (2004b), mitigation calculated from data in Duke (2004b) using average PM max(?) = 0.134 and area of source water habitat = 3,033 hectares.

Conversion factors: 1 m³ = 264.173 US gallons; 1 liter = 0.001 m³; 1 hectare = 1 x 10⁴ m² = 2.471 acres; 1 acre-foot = 325,851 US gallons; 1 megawatt = 10⁶ watts